

U.S. Serial No. 09/657,357
Attorney Docket No. 46613-00117
Amendment under 37 C.F.R. §1.312

IN THE SPECIFICATION:

Please insert the following header after the title on page 1, line 2:

BACKGROUND OF THE INVENTION

Please amend the paragraph beginning at page 1, line 7 as follows:

In the production of films, tapes, sheets and similar two-dimensional, continuously shaped extrudates of thermoplastics, a plastic melt is generally extruded through a slot die to give a surface having a rectangular cross section. It is important here to set a controlled thickness profile of the extrudate by adjusting the die gap. The thickness profile is important for subsequent process steps, such as, for example, the stacking of sheets, the winding of film webs or, for example, the stretching of films, the thermoforming of sheets, etc. For stretched films in particular, a uniform thickness profile of the final film over the entire width depends on the thickness profile of the precursor film.

Please insert the following header after the first paragraph at page 2, line 8:

BRIEF SUMMARY OF THE INVENTION

Please amend the paragraph beginning at page 2, line 15 as follows:

This object is achieved in accordance with the invention by a device for adjusting the gap of a die arrangement using a thermopin, in which the thermopin is connected to the die lip (10) without any play and this play-free fixing of the thermopin (1) to the die lip (10) is effected by means of a clamp-type socket (7), where the said clamp-type

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socket (7) engages on the one hand in a lip nose (11) and on the other hand in a groove (5) of the thermopin (1), where the lip nose (11) is an integral part of the die lip (10) and the clamp-type socket (7) has a bore (8) and the thermopin (1) has a bore (4) and a fixing means is passed through the bores (8) and (4).

Please insert the following heading after the third paragraph at page 2, line 24:

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

Please amend the paragraph beginning at page 2, line 26 as follows:

The invention is explained below with reference to the embodiments shown in the drawings. The figures ~~shown in detail~~ are explained hereafter.

Please amend the paragraph beginning at page 3, line 12 as follows:

Fig. 7 shows a view of the comb strip with the thermopin.

Please insert the following heading after paragraph seven at page 3, line 15:

DETAILED DESCRIPTION OF THE INVENTION

Please amend the paragraph beginning at page 3, line 16 as follows:

Fig. 2 shows the cross section of an adjustment system arrangement. A die lip (10) and a lower die lip (10a) form a die gap (12), whose height can be adjusted with the aid of a thermopin (1). An integral lip nose (11) with groove (13) in the direction of the die gap opening is mounted on the die lip (10). The lip nose (11) includes a plurality of

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slots (11a) defined therein, the intervals between said slots corresponding to the intervals of the thermopins (1). The thermopin (1) is fixed to the die lip (10) at the lip nose (11) by means of a removal clamp-type socket (7). The thermopin (1) has at the lower end (2), i.e., the end facing the die lip (10), a shape which enables the thermopin (1) to be fixed without any play to the lip nose (11) of the die lip (10) by means of the clamp-type socket (7). The shape of the lower end of the thermopin (2) is shown separately in Fig. 3 and is characterized by the following three preferred features:

Please amend the paragraph beginning at page 4, line 18 as follows:

In order to fix the thermopin (1) to the die lip (10), the thermopin (1) is placed on the lip nose (11) in such a way that the groove (5) of the thermopin (1) is oriented in the direction of the die gap opening, i.e., to the front. The clamp-type socket (7) is inserted into the groove (13) of the lip nose (11) and into the groove (5) of the thermopin (1) and is fixed by means of a screw or equivalent fixing means, the fixing means being passed through the bore (8) of the clamp-type socket (7) and through the bore (4) of the thermopin (1) and fixed. The clamp-type socket (7) pulls the thermopin (1) downwards, i.e., in the direction of the lip nose (11), so that the thermopin (1) finally sits firmly on the lip nose (11) through its tapered tip (3) and is connected without any play to the lip nose (11) by means of the clamp-type socket.

Please amend the paragraph beginning at page 4, line 31 as follows:

The tapered shape of the lower end of the thermopin (2) means that the individual thermopins (1) are at no point lined up flush against one another. An

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interspace, which does not occur in known arrangements, is formed between the individual thermopins (1). For example, the claws in DE 38 34 719 are flush against one another. The interspace of the device according to the invention can result in the thermopins (1) rotating in an undesired manner during adjustment. Therefore, in a preferred embodiment of the device according to the invention, a comb strip (14), as shown in detail in Fig. 7, is provided, which is possibly an integral part of the die lip (10) or is preferably in the form of a separate part and is screwed to the die lip (10), as shown in Fig. 2. The comb strip (14) is aligned in such a way here that the row of teeth (15) faces the front, i.e., in the direction of the die opening. The row of teeth (15) of the comb strip (14) is shaped in such a way that the thermopins (1) are inserted with their lower ends (2) into the interspaces of the row of teeth (15) on attachment by means of the clamp-type socket (7) (Fig. 7) and, with the clamp-type sockets (7), sit in a precisely fitting manner between the individual teeth (15) of the comb strip (14). This effectively prevents rotation of the thermopins (1) during adjustment. If necessary, the rotation prevention measure can also be supported by means of a suitable shape of the lower end of the thermopin (2).

Please amend the paragraph beginning at page 5, line 18 as follows:

In accordance with the prior art, the thermopins sit on the die lip at constant intervals over the entire width of the die lip; correspondingly. Correspondingly, these embodiments require use of a comb strip which has a constant interval between the individual teeth. This interval is generally in the range from 20 to 40 mm and is preferably from 25 to 35 mm. During the investigations for the present invention, it was

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found that it is advantageous to arrange the thermopins at different intervals over the width of a die. The different intervals of the thermopins to one another are generally in the range from 5 to 30 mm. Correspondingly, the comb strip for this embodiment has tooth intervals matched to the spacing and physical size sizes of the thermopins. It has been found that this arrangement with different intervals of the thermopins enables significantly more precise adjustment of the thickness profile over the entire film width, in particular in areas which are otherwise difficult to adjust. This inventive idea can of course advantageously be used for any device in which the die gap is set by means of several adjustment elements distributed over the width of the die.

Please amend the paragraph beginning at page 6, line 1 as follows:

The thermopin (1) is surrounded by a coil-type heating/cooling cartridge (19) in such a way that the thermopin (1) can be heated or cooled. The upper end of the thermopin (16), i.e., the end remote from the die lip (10), has an external thread (17). By means of this external thread (17), the thermopin (1) is connected to a horizontal retention strip (20) of the die lip (10). For manual adjustment of the thermopin, a bore with internal thread, which is in turn designed with a threaded pin as a differential screw connection, is incorporated into the retention strip (20).

Please amend the paragraph beginning at page 6, line 10 as follows:

This differential screw connection enables pre-adjustment of the die gap (12) by moving the thermopin (1) upwards or downwards in overall terms by screwing the differential screw connection. The fine adjustment of the die gap (12) is carried out by

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warming or cooling the thermopin (1). On warming, the thermopin (1) expands and exerts a pressure on the lip nose (11) and thus reduces the gap (12), i.e., on warming of the thermopin (1) the gap (12) becomes narrower at this point. Conversely, the thermopin (1) contracts on cooling and increases the die gap (12) at this point. In order to enable punctiform introduction of force into the lip nose (11) even under the action of tension, the clamp-type socket (7) is preferably designed with a chamfered claw (21).

Please amend the paragraph beginning at page 6, line 31 as follows:

The shaping of the thermopin (1) in accordance with the invention with a tapered, preferably pointed end (3) and the preferably chamfered claw (21) results in very precise adjustment of the die gap (12). Since the thermopin (1) only presses onto the lip nose (11) with its pointed tip (3) during warming and pulls in a punctiform manner at the lip nose (11) with the chamfered claw (21) of the clamp-type socket (7) during cooling, the effect of the adjustment of this die pin zone on the adjacent die pin zones on the left and right is greatly reduced. The die deforms in a spatially more narrowly restricted region, i.e., essentially only where the thermopin (1) acts, i.e., exerts a pressure or tension. The design according to the invention of the lower end of the thermopin (2) and of the clamp-type socket (7) is an improvement upon the prior art by facilitating a more direct and precise die gap (12) adjustment using the thermopins (1) which is improved compared with the prior art.

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Please amend the paragraph beginning at page 8, line 11 as follows:

- There is no weakening of the thermopin (1) by the hole bore. ~~This allows,~~
thus allowing a greater adjustment range.